TITLE: The WIRE Image Simulator

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ABSTRACT TEXT:

The Wide-Field Infrared Explorer (WIRE) is a cryogenically-cooled spaceborne telescope designed to study the evolution of starburst galaxies. Scheduled for a September 1998 launch as NASA's fifth Small Explorer mission, WIRE will employ a 30 cm aperture Ritchey-Chretien telescope to image a 33 by 33 arcminute field simultaneously onto two Si:As IBC detector arrays covering broad bands centered at 12 and 25 microns. A three-part survey strategy calls for moderate-depth (about 15 minutes total integration time), deep (3-6 hours), and ultra-deep (24 hours) fields. For the deep fields, hundreds of background-limited exposures will be recorded by the WIRE instrument over many orbits, and rectified, registered, and combined on the ground. The sensitivity of these final images will be limited by source confusion. The WIRE Image Simulator is being developed to simulate the exposures sent down from the spacecraft as closely as possible, including the effects of diffraction, background noise, source confusion, stray light, and spacecraft jitter. We describe the design and implementation of the simulator. Sample raw and combined images are displayed, and the image processing steps are outlined. The uses of the simulator to verify that mission requirements are met, to optimize observing strategy, and to test data analysis techniques are also described.